N.A.C.A. BULLETIN

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JUNE 1, 1949

RETAIL INVENTORY METHOD ADAPTED TO APPLIANCE MERCHANDISING IN A PUBLIC UTILITY

by FRANK D. McAULEY,
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Elimination of stock ledgers and unit costing, increased dependability of sales price records, and—as the prime objective—simpler and better accounting for household appliance sales, costs, and inventories are reported in this article which, none the less, points out obstacles encountered in applying the retail method of inventory accounting to public utility merchandise. Of these obstacles, difficulties in the reconciliation of serial physical inventories by classes of merchandise to the corresponding retail dollar class totals is given principal attention.

IN recognition of differences such as those between accounting for a merchandise inventory and for a general supplies inventory (with which public utility accountants have perhaps had greater familiarity), the retail method—which is fundamentally a method of averages—was evolved and has been widely used by many department stores as a common-sense method of controlling and valuing the elusive and multifarious type of inventory represented by floor, shelf, and counter goods. Inasmuch as department store accounting bears a strong family resemblance to utility merchandise accounting, the latter operations may well be expedited and clerical costs reduced by adoption of the retail method.

In the first place, what are some of the differences referred to? There are three which appear to me to be basic:

1. The tightness of physical control possible in a general supplies inventory is not feasible with merchandise, as stock on sales floors, etc., is not locked up and is accessible in varying degree to customers and employees.
2. Merchandise is frequently issued in an atmosphere of bargain-counter pressure by salesmen whose primary interest —service to the customer—relegates inventory control to a secondary consideration.
3. The dual function of a sales slip as compared with the single purpose of a material issued slip, a sales slip being

MILLENDER
DISTRIBUTORS, INC.
619 ATLANTIC AVE., BOSTON 10, MASS.
Liberty 0111

HOUSEWARE & KITCHEN APPLIANCES

TRADE — RECORD — MUSICAL ACCESSORIES — TELEVISION — LAMPS

SOLD TO

16833

SHIPPED TO

May 5, 1947

51

YOUR ORDER NO. 8070-Grimm

10 DAYS

12 Thi-l Electronaire range 104.75 100.07 ea 71977.00
1200.84

23858
858
858
858
858
858

Last 164.75

All goods returned for credit must have our permission & this packing slip must accompany shipment

10 days

MERCHANDISE PURCHASE RECORD — CLASS 51

DATE	VOUCHER NO.	RETAIL	COST
	34	3,877.00	1,860.96
	66	310.50	189.20
	33	890.95	438.06
	147	-	147.06
	290	180.95	101.09
	264	1,430.95	922.00
		3,130.50	1,809.57

DATE	VOUCHER NO.	RETAIL	COST

SUMMARY OF MERCHANDISE SALES

LINE	ITEM	SALES AMOUNT	%	CLASS	SALES NO.	DATE
1	OPENING INVENTORY (COST)	36,202.05		RANGES	01	3,877.00
2	PURCHASES	1,086.90	3.0	REFRIGERATORS	02	310.50
3	MARK-UP ON RETAIL PURCHASES		36.5	WATER HEATERS	03	890.95
4	TRANSFERS OUT (AT COST)	3,000.25		FREEZERS	04	539.95
5	TRANSFERS IN			FLAT GOODS	05	1,293.50
6	ADDITIONAL MARK-UPS	115.95		WASHERS	06	261.90
7	TOTAL TO BE ACCOUNTED FOR	30,208.65		COFFEE MAKERS	07	309.95
8	GOOD SALES MERCHANDISE (NOW RETURNED)	1,200.65		TOASTERS	08	2,499.97
9				GRILLS	09	1,196.16
10				CLEANERS	10	5,695.90
11	MARK-DOWNS (NET)	206.90		WARMERS	11	1,899.55
12				SMALL APPLIANCES	12	189.10
13	TOTAL REDUCTIONS	1,407.55		CONSOLES	13	
14	CLOSING INVENTORY	15,080.10		CHAIRS	14	
15	INVENTORY ADJUSTMENTS (SHORT OR OVER)	405.30		HEATERS	15	133.95
16	ADJUSTED INVENTORY	14,674.80		LAMPS	16	1,588.16
	COST			RUGS	17	519.14
17	OPENING INVENTORY (AT RETAIL)	30,100.00		PLATES	18	208.72
18	PURCHASES	2,855.57		MIXERS	19	198.75
19	TRANSFERS OUT	115.21		CLOCKS	20	198.75
20	TRANSFERS IN			FREEZERS	21	89.95
21	TOTAL TO BE ACCOUNTED FOR	32,840.36		RUGS WASHERS	22	
22	TOTAL SALES	7,558.23		BLANKETS	23	1,799.15
23	MARK-UP ON RETAIL	37.4		MISCELLANEOUS	24	835.46
24	COST % OF RETAIL	62.6		ROASTERS	25	
25	CLOSING INVENTORY (AT RETAIL)	19934		CARBURETORS	26	
26	ADJUSTED INVENTORY (COST OR OVER)	12477		WATER HEATERS	27	
27	ADJUSTED INVENTORY	25205			28	
28	COST OF GOODS SOLD (NOW RETURNED)	21.87		GOOD SALES MERCHANDISE (NOW RETURNED)	29	1,200.65
29				DISCOUNTS AND OTHER ALLOWANCES	30	3,000.00
30				CARTAGE CHARGES	31	189.95
	TWELVE MONTHS STATISTICS			NET MERCHANDISE SALES	32	4,168.30
31	RETAIL SALES (ONE YEAR 12 MONTHS)	36,276.80		GOOD SALES / APPLIANCE RETURNS		689.30
32	ADJUSTED RETAIL STOCK (12 MONTHS)	295,000.55				
33	AVERAGE RETAIL INVENTORY	8,266.66		TOTAL GROSS SALES BILLED		34,347.13
34	GROSS MARGIN PER YEAR	8,266.66				4,168.30

the basis not only of the issue from stock at cost but also the medium of recording revenue at retail.

Merchandise Classification

Under the cost method, it has long been considered a practicable short cut to average the cost prices of an entire stock of a single *model* of appliance. The retail method widens the scope of the averaging by combining all appliances of a similar *type* (such as toasters) regardless of model, manufacturer, or price. It is even possible to broaden the grouping to types of similar character (and markup) if care is exercised. The retail method does not attempt to control inventories by exact quantities. Instead it establishes dollar control by *classes* at retail directly from purchase invoices. Inasmuch as sales slips *must* contain retail prices, the issues from stores become simply the gross sales for the class for the month. The retail method differs from the cost method in the technique used in controlling inventories and determining cost of goods sold but not in accounting for gross and net sales and merchandise expenses.

To lessen the effect of variations in markup which exist among the different merchandise appliances and also to establish the multiple inventory controls called for, the entire merchandise stock of a public utility may be divided into twenty-five or thirty classes. The merchandise stock of a utility being limited to appliances that use gas or electricity, requires a smaller number of classes than does the more diverse stock of a department store, and the merchandise utility classifications may practicably be composed of more homogeneous items, which should assist in obtaining especially reliable results from operation of the system as a whole. A list of twenty-eight classes appears in Exhibit 1.

Forms Basic to the Retail Inventory Method

This article describes and discusses an application, considered successful, of the retail inventory method to utility merchandise accounting. Other than the listing of classifications only one class (ranges) is dealt with in the initial portion of this article. It will serve to provide adequate illustration of the operation of the retail method as applied to merchandise held for sale by a public utility. Attention is directed to Exhibit 1 which is a composite of four forms fitted together with the aid of a pair of scissors and reduced

in size. These forms are: purchase invoice, purchase record, merchandise synopsis, and summary of sales.

The purchase invoice is given to provide figures for follow through. Of the three record forms, the purchase record is a very simple affair, consisting only of date, reference, retail, and cost columns. One sheet is used for each class (ranges, in this case) and successive month's purchases follow one another until the sheet is filled. The merchandise synopsis is the form on which results are shown. It is the most important form in the retail system and is used to control inventory (Line 16) and to calculate the cost of merchandise sold (Line 28). For our illustration we need only one column of the synopsis but the record in actual use provides a column each for about thirty classes and consists of a set of three sheets. It may be mentioned that this three-sheet record is the equivalent of a 500 to 1,000 page cost plan stores ledger. A separate set of synopsis sheets is used for each month.

The summary of sales form reflects the summary of all sales slips for the month by classes. It may be noted that this summary is in a form commonly called a "peg strip." The use of the peg strip form for this operation is not a necessary part of the retail system, but we have found it a "natural" for it affords speedy summarization of sales slips daily and cross-footing monthly. When each daily bundle of sales slips is received in the accounting department, it has one of these peg strips attached. After checking the arithmetic, classes, etc., our accounting clerk files these peg strips until the month end, when she shingles them on a pegboard, crossfoots, and enters the totals on a total sales summary form giving figures of the sort which are shown in the exhibit. The peg strip saves the longhand recopying of the daily figures to a monthly summary. This peg strip summary of sales also deserves attention from another angle. It emphasizes the simplicity inherent in the retail method. The accounting department is able to obtain all essential sales and cost of sales data from the *single* figure that all sales slips *must* carry, namely, the selling price.

Arrows have been superimposed on Exhibit 1 so that the interrelationship of the four forms may be made clear. On receipt of a purchase invoice in the sales department, the retail price is written in a distinctive color directly on it. Following the arrows down from the purchase invoice in the upper left-hand corner, it may be seen that this invoice, after having been vouchered in the

accounting department, is posted to the purchase record and combined with all other range invoices for the month to arrive at totals of $4,384.90 at retail, and $2,855.57 at cost. The arrows then direct attention to Lines 2 and 18 of the merchandise synopsis on which these monthly totals of purchases at retail and cost are entered. Monthly total of range sales comes to the synopsis, as the remaining arrow indicates, from the summary of sales. Parenthetically, it may be remembered that in practice each figure in the summary of sales has its proper column in the merchandise synopsis.

Operation of the Merchandise Synopsis

Now that figures have been traced from purchase and sales sources to the merchandise synopsis, how are they used to obtain the desired results? The top section of the synopsis deals with retail values. It opens with the beginning inventory at retail, adds the retail value of purchases (and "additional markups" made after the date of the applicable purchases), and adds or subtracts the retail value of merchandise transferred from any other classification. Deducted are sales and markdowns to arrive at the retail value of the ending inventory. The cost section of the synopsis follows and presents the cost counterpart of the retail figures for opening inventory, purchases, and transfers.

The total of these "inbound" figures at cost (Line 21)—subtracted from the comparable retail data (Line 7)—yields the markup and, upon division by Line 7, yields the markup percentage. This proves to be 37.40 per cent of Line 7 and its reciprocal, 62.60, is the cost percentage which, applied to Line 7, gives the closing inventory at cost under the retail method. The inventory adjustment at retail is also multiplied by the cost percentage and the adjustment and adjusted inventory at cost are obtained in this way. This adjusted inventory at cost subtracted from Line 21, yields retail inventory method cost of sales, which should differ from the comparable cost method figure only to the extent that the markup on items in the various classifications of goods in the closing inventory may vary, on the average, from the average markup in the same classifications represented by the opening inventory and purchase and markup data for the period.

There should perhaps be a word said about "additional markup" and "markdowns." Both are needed to carry the inventory at

retail through from its opening to its closing balances and both are provided for in the synopsis. Incidentally, there must be authorization, usually price change slips, in either case. However, of these two items, only the additional markup are allowed to affect the calculation of the markup percentage, increasing it, so that both original and additional markups will be eliminated in arriving at inventory at cost. Markdowns, which would decrease the markup percentage and might conceivably be allowed to do so, are not considered, with the result that, when sales prices are reduced by markdowns, unchanged markup and cost percentages will in effect result in a reduction of inventory to a practical cost or market basis.

It should be noted also that the top or retail section of the synopsis is used to control physical inventories. We deal with no cost figures in controlling inventory inasmuch as physical counts are priced at selling prices only. The bottom or cost section of the synopsis is used solely to value the inventory at derived cost and to calculate the cost of merchandise sold. For this reason, if it is desired to maintain an inventory control of each branch store, a separate synopsis may be kept for each store at *retail only*.

Importance of Centralized Price List

The importance to the proper operation of the retail inventory method of maintaining a centralized, up-to-date selling price list of every piece of merchandise the sales department handles is obvious. This list is a bench mark to which all sales slips must be compared and should be maintained in all sales offices. It is surprising how often it will be found that such a list does not exist but in its place a mixture of salesmen's price books, miscellaneous cards and sheets, and a heavy reliance on manufacturers' catalogs. If this condition is found, it will be immediately realized that the company is either not maintaining a very close check on the selling prices shown on sales slips, or is spending a great deal of time in checking prices to a cumbersome variety of sources. If such a complete up-to-date selling price list is found, this constitutes practical assurance that the *one* sales office function fundamental to the retail plan is being carried out properly.

The Merchandise Report

The retail inventory method is not *merely* a short cut to costing sales and valuing and controlling inventories under given circum-

stances. The statistical results obtained—merely as a by-product of the retail plan—include the three-page merchandise report which is drawn off monthly from the merchandise synopsis. The three sheets are, respectively, Data on Sales and Gross Profit; Data on Purchases, Markups, and Markdowns; and Data on Inventories. Each of these sheets holds a line for each merchandise class. The column headings for each are as follows:

*Data on sale and gross profit**	*Data on purchases, markups, and markdowns**	*Data on inventories*
Class	Class	Class
Net merchandise sales	Purchases at retail	Average retail value for last 12 months
Cost of goods sold	Per cent markup on invoices	Current retail value
Gross profit	Cumulative markup per cent	Current cost
Amount	Markdowns at retail	Times turned per year
Per cent of sales less returns	Amount	Inventory adjustments at cost
	Per cent of sales less returns	

* Separate columns for month and period to date.

Accountants, possibly seeing the merchandise report for the first time, cannot help but appreciate the wealth of useful information it supplies by *classes,* on such things as sales, gross profit, inventory, and turnover. However, few of our sales people are impressed with it. We find it useful to watch the inventory picture and to see that the various percentages are normal. There is a partial explanation for this lack of interest on the part of the sales people in that they build up *their* story on net merchandise sales, but not on gross profits, purchases, inventories, turnover, etc. It may be of interest to mention that the gross profit per cent of net merchandise sales which we arrive at compares closely with data developed by companies operating on the cost plan, an assurance that our use of the retail method has not carried us away from accuracy in our search for simplicity.

Clerical Time Performance

At the present time, we estimate—conservatively, we believe—that the use of the retail inventory method achieves an economy in clerical operations of 30 per cent to 35 per cent. As later noted, the economy would be greater but for some trouble experienced in

reconciling class physical inventories, taken on a serial basis, to the merchandise synopsis for the class. The following is an estimate of the time required in the accounting department to process the major portion of the retail system. The items are listed in pretty much the order in which they have come up for discussion in this article:

Item	*Hours per month*
Posting and proving purchase book.....	3 to 6
Checking daily summary of sales.....	8 to 12
Crossfooting monthly summary of sales..	½ to 1
Processing transfers, markups, and markdowns	1 to 4
Posting and calculating merchandise synopsis	4 to 6
Taking monthly cycle physical inventory...	5 to 8
Reconciling physical inventory	8 to 24
	29½ to 61
Drawing off merchandise report.....	3 to 5

The above estimate does not include such accounting work as setting up, posting, and balancing the merchandise accounts receivable ledgers, checking and paying commissions, cashiering, monthly installment billing, collecting, and other clerical functions that would be performed by the accounting department for the sales department under either the cost or retail system of maintaining inventories. However, I must confess that, although these figures for the individual steps look conservative to me—and I have checked them with my supervisors—the accounting department clerk has to spend more over-all time than these figures would indicate. As the electrical engineers sometimes say, "there must be a certain amount of 'wattless current' skulking around." In this case, it is probable that the extra time is spent in chasing out loose ends on inventory reconciliations. This matter is considered later on in this paper when the matter of supplementing the dollar and class merchandise controls provided by the retail method is taken up.

The estimate of time required to draw off the merchandise report has been shown separately in the above figures, inasmuch as

this report is not a part of the recording and calculating operations necessary to carry on the retail system. It is simply an abstract made from the books after the calculations have been completed, and is more in the nature of a detailed financial report for internal consumption. The small amount of time required each month to post and calculate the merchandise synopsis may well be noted. This record is a veritable anchor to windward for handling increases in sales volume. A brief perusal of this record will reveal that *it requires no more time to compute the cost of sales on, say, $100,000 sales volume that it does for a $1,000 sales volume.* Compare this with the cost system of inventory under which the work of costing sales slips and posting the stores ledger increases in just about direct ratio to the increase in the number of sales slips.

The clerical work required in the sales department due to the retail system is difficult to estimate, because so much of the retail method requirements parallel work performed by the sales office staff anyway. Most sales departments build up sales volume statistics by appliances, the very thing required by our peg strip daily summary of sales. The writing of occasional markup and markdown slips is an extra operation, as is the writing of retail prices and class numbers on purchase invoices, and the entering of the merchandise class on the sales slips.

If more work is entailed in maintaining a centralized, complete selling price list, it is only because this important record may have been neglected previously. Furthermore, this selling price list will save repeated reference to manufacturers' catalogs for the same item. As will be seen later the retail inventory system reduces clerical work in the sales office on all phases of appliance repair work, through the elimination of most material issued slips, a reduction of about 50 per cent in job orders, and because it is no longer necessary to keep track of exact postage and insurance costs on each factory appliance repaired.

A better evaluation of the clerical volume in the sales office, when the retail inventory method is in operation, may possibly be afforded by the simple statement that in our 40,000 meter company, with a volume of from 1,100 to 1,300 sales slips a month, two sales office clerks do the entire secretarial, filing, purchasing, and sales clerical work of the sales department, including receiving, dispatching, and *billing* for appliance repair calls.

Physical Inventory Reconciliations and Differences

As stated earlier, still greater economy in use of clerical time would be achieved under the retail method of inventory as we have applied it, were it not for the trouble that we have experienced in reconciling physical inventories to the synopsis. This trouble centers around two factors:

1. The difficulty of quickly gathering together the various underlying papers that are incomplete at the time during the month that a physical count of the particular class of items is made. These papers consist of such things as material received reports awaiting invoices, shipping notices awaiting credits, sales slips delayed because of disputed signatures, approvals, etc. In not having a detailed stores ledger to which many of these records would have been posted at least in memorandum form, these incomplete papers rest in the "home made" files of the several people involved. These incomplete papers, in the possession of several people, have also been found to be filed in no consistent manner. The stockman may file his by vendors and dates, the sales office theirs by vendor and by purchase orders, etc., and what is worse, an individual clerk may have used a combination of filing methods.
2. Failure on the part of the sales office to thoroughly check sales slips to the selling price list.

We think we are on our way to correcting both these conditions. We have set up class files in the storeroom, sales office, and accounting department, consisting of separate folders for each class and we require each person to adhere rigidly to class filing. Also, we have set up the physical stock according to class, with large class signs displayed over each bay of shelving so that even a casual visitor could walk through the storeroom and spot merchandise not stored in its proper bay. Thus, if we were taking an inventory of, say, flatirons, all incomplete papers that any clerk may have on the subject of flatirons would be kept in a single folder. In the accounting department, the active class file extends back to the previous inventory so that if we were checking a stubborn flatiron difference, for example, all sales slips for flatirons would be filed together, so that our accounting clerk is saved the task of picking out flatiron sales slips formerly filed with all other ap-

pliances. As to the second difficulty, we have set up the sales office selling price list on visible files. This has made the file much more accessible for reference and posting than our former conventional card file.

For the past three years, our inventory differences have been running from about one-half of one per cent to one and one-half per cent of our average inventory. An important fact to keep in mind when comparing inventory differences under the retail plan with results under the cost plan, is that the retail method includes not only overs and shorts in *quantities* but also overs and shorts in *dollars* caused by selling at incorrect prices. To illustrate, an appliance with a selling price of $150 is posted to the synopsis on line 2, purchases. Through carelessness this appliance is sold for $140, and will reach line 8 of the synopsis as sales. This leaves ten retail dollars on line 14 of the synopsis to be accounted for at inventory time. This same type of error, occurring under the cost plan, would doubtless be buried in gross sales and probably would never be detected by the accounting department. Thus, the retail method controls an element that the accounting department of a company maintaining a merchandise inventory on the cost plan would probably not even be aware of, namely, the selling price.

Advantages and Disadvantages of the Application

We have reached the point now where it is apparent that certain real advantages are to be gained from extension of the retail inventory method to utility merchandise stocks. Disadvantages have also been mentioned and others may have come to mind during the course of the coverage of the subject so far. A listing of both advantages and disadvantages may help in appraising the use of the retail inventory method here described. For advantages:

1. The retail method dispenses with unit costing of each sales slip.
2. The flow of sales slips to the accounting department and the recording of charges to accounts receivable is expedited, as sales slips are not held in the sales department or storeroom for unit costing and detailed posting to stores ledger or because of delayed purchase invoices (if the selling price is known), freight, or express bills.
3. Parallel valuation in books and on stock is assured because physical inventories are priced from *tagged* merchandise.

4. The retail method establishes a rigid control of selling prices. If variations from the original marked selling prices are not brought to the attention of the sales manager at the time of the sale and markups or markdowns approved, an inventory "dollar" difference will occur.
5. The retail method provides for effecting proper merchandise "depreciation" on the books by taking markdowns as selling values fluctuate, thus not burdening the future with carried-over losses due to obsolete stock or to overbuying at high prices.
6. Turnover data, an important factor in successful merchandising, is provided on each merchandise *class* rather than on the total stock only.
7. Inasmuch as costs do not appear on tagged merchandise or on sales slips, inventories, salesmen's price books, etc., the selling staff does not become familiar with costs. Consequently, customers are not apt accidentally to learn cost prices on appliances purchased.
8. Increased sales volume, caused by special campaigns on such items as lamps, flatirons, etc., can be absorbed with less increase in clerical work, inasmuch as unit costing of sales slips and detailed posting to stores ledgers have been eliminated.
9. Branch store inventories can be controlled with less clerical work, inasmuch as dollar inventory controls by classes entail less work than quantity controls for each type, manufacture, and model.
10. Annual reconciliation of detailed stores ledger with general books is eliminated.
11. Daily flow of *delivered* sales slips to the accounting department creates desirable condition under which payment of salesmen's commissions is based on *"accounting recorded"* sales.

It is possible to number disadvantages which may be significant in some situations:

1. Sales people miss the quantity control which the cost method provides in the stores ledger. While doubtless some sales managers avail themselves of the information shown

by the stores ledger, I think there are instances where, because the stores ledger is not always up to date, the sales manager or his floor supervisor prefer to take a quick count of the actual stock. One sales manager told me that he considered it a prerequisite of a good sales floor supervisor that he be thoroughly familiar with the physical stock and not rely on a book inventory for quantities.

2. Sales people dislike having to make markups and markdowns in writing.

3. The sales department is bothered by our strict adherence to monthly cycle inventories (we inventory about five classes each month) and would apparently prefer to have only one or two grand cleanup inventories a year. I might add that under either system, it is possible to take as many or as few physical counts as desired.

4. The sales department dislikes being reminded that some of their merchandise is not properly tagged with the selling price. Untagged merchandise is more noticeable under the retail system, as we price physical counts from tagged merchandise.

5. Under the retail system, both the accounting and sales staffs are more aware of the time required to "fit in" some new selling angle, such as a special combination sale of a stick type vacuum cleaner and a handette cleaner for a single price. It is true that the retail system (being a mass production concept) entails more "tooling up" time, as it constantly strives to reduce recurring "special handling" situations. The cost plan is more flexible in this respect, in that it treats each sales slip separately.

6. When visiting auditors take test physical counts under the cost system, they can select a much smaller quantity to count. For example: they could select a particular manufacturer and model of flatiron and, after counting this limited quantity, could compare it with the detailed stores ledger page. Under the retail system, they would have to count all the flatirons and, until we recently established our class files throughout, they experienced difficulty in gathering up the incomplete papers at the moment of taking the physical count.

7. Some accountants feel that the burden of keeping track of selling prices and variations in selling prices through markups and markdowns, is such a nuisance that it offsets the gain in not costing sales slips and posting each sales slip to the stores ledger and the averaging of prices in the stores ledger. On this point, I think the accountants might have a case in some businesses where a great many bargain sales are held, but in a utility I think that the savings on sales slips and stores ledgers—plus the advantage of speedy transmission of sales slip to the customers' accounts receivable ledger—outweighs the disadvantages of control through selling prices.

Repair Parts As a Single Class of Merchandise

In the physical and book control of electric repair parts stock, a condition is usually encountered that is peculiar to that type of stock, namely, that the custodian is also the user of the stock. Thus we lose the clear line of demarcation that exists in the average general supplies inventory where the stock is locked up and under the custody of a storekeeper and issued only to the user upon presentation of an approved material issued slip. The appliance repairman (who is both custodian and user) frequently salvages useful parts from appliances being repaired and, unless he is unusually conscientious, is prone to neglect his "material returned to stores" paper, with the result that the stores ledger does not reflect at all times an accurate quantity-on-hand figure.

Repair parts stock (for an electric company, especially) includes so many physically small pieces that are tucked away in drawers, bins, envelopes, and all sorts of containers that frequent errors are made by the appliance repairman in describing on the job order or repair tag, the pieces he has used which again results in inaccuracies in the stores ledger. Posting the stores ledger with its several hundred items of repair parts stock, entailing as it does a voluminous amount of clerical work, creates an impression of meticulous accuracy that is an illusion, due to the "custodian-user" condition. Human element errors in the descriptions of the parts on the job order, in deciphering the workman's penmanship, and posting to the stores ledger further increase the discrepancies.

It is because of the existence of these inherent obstacles to the achievement of quantity accuracy that the retail method treats the

entire repair parts stock as *one* class. All parts in stock show the *selling* prices on the bin cards in addition to the usual description of the part. Thus, under the retail method, errors in description or unintelligible penmanship on job orders, repair tags, and all underlying papers, do not affect the accuracy of:

1. Billing to the customer—as the price is taken from the bin card; or
2. Inventory control—as the issue from stock is simply the selling price of the item billed.

Complete bin pricing eliminates lengthy research through manufacturers' catalogs for prices to be used on sales slips, inventories, etc. *In the interest of good housekeeping, the importance of adequate space, suitable shelving, and bins for the appliance repairman's stock cannot be stressed too much.* Placing the repair parts under the retail plan saves costing the underlying work papers, eliminates material issued slips for job charges, and, of course, does away with the voluminous detailed stores ledger. We consider the appliance repairman in the same category as a salesman, in that the repairman sells parts, transportation, and labor at prearranged selling prices.

Suitability of Retail Inventory Method to Utility Merchandise

It has been said that the retail inventory method is particularly well suited to the handling of the sale of a large number of small appliances, but this leaves the impression that it is not a time-saver when handling the sale of a large number of large appliances. The retail system saves time on each item regardless of whether it may be classed as a small or a large appliance. For that matter, it frequently happens that the sales of large appliances exceed the sales of the smaller. For example, in a recent month, one of our companies sold more refrigerators than floor lamps. Possibly this tendency to think of the retail system as poorly adapted to accurately costing large appliances is due to a belief that there is a greater variation of percentage of markup between, say, the several kinds of ranges than in the case of, say, toasters. I do not believe any particular class, as compared with another, consistently shows a wider swing of markup percentages within the class. However, if a sizeable variation did exist, say in ranges, then the single range class could be divided into two or more classes according to uniformity of markup.

The retail inventory method will speed the work of recording sales, charges to accounts receivable, and the proving of salesmen's commissions. It will produce accurate cost of sales information when care is exercised in handling invoices, marking goods, and reporting markups and markdowns. From this point of view, it requires cooperation between the sales and accounting departments. The system requires a capable type of general accounting clerk to operate the synopsis record and coordinate the working of the sales and accounting staffs. In the final analysis, the decision for or against the retail system rests with management, as it alone can evaluate objectively the over-all company policy. Management is more interested in net expense to the company than is any individual department. The evaluation should not, however, omit to consider that statistical data by classes in the merchandise report on sales, profits, inventories, and turnover are primarily aids to management control.

COMING ARTICLES

In the *N. A. C. A. Bulletin*, June 15, 1949

The Accounting Executive and Control Through Cooperative Effort
by David R. Anderson

The Functional Cycles of Management and Accounting
by Chester F. Lay

Goals and Methods of Profit-Minded Management
by A. Winston Sykes

COSTING REPLACEMENT PARTS SALES BY MODIFIED RETAIL INVENTORY METHOD

by WARNER V. STOUGHTON,
Manager, Internal Audit Division,
Caterpillar Tractor Co.,
Peoria, Ill.

The replacement parts inventories of a machinery manufacturer may be large, diverse, and scattered in location. In some or all of these respects, they perhaps invite limited comparison with the inventories of large retailers. An effective application of a costing technique based on a ratio developed and tested along the lines of calculation of cost percentages under the retail inventory method is described in this paper.

IN a recent address, Professor Himmelblau of Northwestern University suggested half seriously that industrial accountants would be well advised to transfer their profound interest in and their consideration of "lifo," "fifo," "hifo" and "nifo" for the purpose of inventory valuation, in favor of an adaptation of the more understandable retail inventory method. While the remarks referred to were directed largely to the problem of inventory valuation, the method to be described here—a modification of the retail method, applied to replacement parts—was adopted rather for the purpose of simplification of the clerical work involved in handling annual volume involved in hundreds of thousands of transactions affecting replacement parts. The system has been developing at Caterpillar for a period of several years and, in the opinion of our management, has produced an accurate cost of parts sales and adequate estimates of related ending inventory balances (and at the same time permits a satisfactory degree of inventory control) for a reasonable cost.

The company markets the major portion of its production to independent domestic and foreign distributors and dealers for resale by them to user customers. Direct sales, however, are made to the Federal government and to manufacturers of products powered by Caterpillar diesel engines. The aforementioned distributors and dealers are essentially sales and service organizations and, as

such, are expected to maintain adequate parts inventories of their own for replacement sale purposes.

Normally, the dealer inventories are periodically replenished by stock orders placed direct with the factory. However, in order to expedite service to both the dealers and their user customers, the company also maintains eight emergency parts depots strategically located throughout the United States from which replacement parts can be delivered to almost any point in the country and much of Canada within approximately twenty-four hours after the receipt of an order. Thus, parts inventories are maintained by the company at nine locations—the eight parts depots and the main factory.

Principles of the Retail Inventory Method

Under the retail method of inventory control, cost of sales and cost of inventory are direct derivatives of the price at which the items are offered for sale. Usually, controlling accounts are maintained which record the accumulated retail price of merchandise on hand, by more or less broad classifications of items of similar character and profit markup, with the entries thereto reflecting increases through acquisitions and decreases through sales. Merchandise balances represented by the controlling accounts are verified by periodic physical inventories priced at retail prices, usually affixed to merchandise. This system is most practical when an inventory includes thousands of small items which at best are inventoried and costed only by laborious processes. The retail inventory method, built upon the use of averages, is usually justified by the relatively higher cost of maintaining an alternate system that can be expected to accomplish the desired results.

The Company's System; Use of A General Cost Percentage

Caterpillar replacement parts inventories include more than 70,000 items ranging in cost and selling price from a few cents to hundreds of dollars. Many parts are stocked in substantial quantities. However, individual parts depot inventories are not *necessarily* comparable to each other nor representative of the over-all line of company products, primarily because of variations in the machine population of their respective territories. Yet, as will be seen, this similarity is assumed for practical purposes and periodically tested.

Necessarily, conventional retail inventory methods provide for the development and maintenance of a percentage which will (in effect) reverse the markon contained in the selling price on which the retail inventory control summaries are maintained, and so obtain inventory at cost. The successful use of such a system is predicated upon a percentage which will remove in a consistently accurate way the average markon of the merchandise items composing the inventory classification to which it is applied. In the department store field, such a percentage is a ratio of the accumulated costs and selling prices of items which were on hand at the time of the opening inventory of the period and those items which have been acquired since that date. The general cost percentage of selling price used by our company for all locations and all parts is determined without consideration of inventory, on the basis of continuous monthly computation and accumulation of the cost and selling price of (1) parts transferred from production stores to parts stores and (2) purchases of parts. As described more fully in the next paragraph, we actually use a set percentage from month to month, tested by these and other memorandum computations described later. In the accumulation of cost figures all product costs of parts (manufactured and purchased) are recorded at standard cost, the variances pertaining thereto having previously been charged or credited to profit and loss accounts.

As indicated, the general cost percentage (average) described above, determined and placed in use by the company, has been constantly checked by analysis and review and, as necessary, has been changed in order to make sure that it reflects current relationships. Each month, quantities of replacement parts moving into parts stores as well as quantities of purchased finished parts are individually recorded in punched accounting cards, which, in turn, are simultaneously costed at standard cost and priced at retail by collation with a deck of master costing and pricing cards. The extension of quantities and footing of values by both cost and price is rather simply effected by the "digiting" process. A "new" general cost percentage is determined for the current month's acquisitions from the accumulated totals. This monthly percentage is compared with the general cost percentage in actual use and changes to the latter are considered. Normally, the general cost percentage in actual use is not adjusted for small variations in the monthly per-

centages. It seems important to emphasize at this point that under this system the general parts cost percentage in use is subject to constant review, based upon "current" additions to parts stores inventory, for the use of a continuing percentage from month to month might appear to be at variance with the basis of the retail method.

Determining Cost of Parts Sales

Cost of parts sales is determined in a manner consistent with other retail inventory methods. All invoices, regardless of point of issuance, are posted to the accounts receivable ledgers maintained by the general office. As an aid to sales and inventory classification, a separate invoice prefix is assigned for each parts depot and the factory and a separate series of invoice numbers is used for each such classification. Invoices representing sales made by the factory are individually priced at retail, by mechanical methods, and sales invoices covering shipments by parts depots are priced manually. The sales totals are accumulated by the general office for the respective invoicing points to permit the determination of the estimated cost of sales for each location by application of the general parts cost percentage. Control of sales totals is assured by accounting for invoice numbers in each series.

Transfers between the nine inventory locations are also recorded and priced at retail on similar invoices and cost determined, as with outside sales, to permit monthly inventory transfer postings at cost. This "cost" is, of course, an estimate of the standard cost of these transfers. Accounting control is maintained by the use of the prefixes mentioned, supplemented in these instances by a suffix indicating the destination location within the company's organization. A separate series of invoice numbers is used for each of these transfer classifications. Most of the volume of these transfers naturally represent the replenishment of the parts depot inventories through shipments from the factory. While to some, this intracompany invoicing operation may seem partly unnecessary, since accounts receivable are not involved, it affords in combination with billing of outside sales, as described, an economical method of recording, by means of a standard billing routine, shipments at retail prices of replacement parts from any point within the company to any point within or without the company. Furthermore, a by-product of this system is the fact that the dissemination of cost data is reduced to a minimum. The totals of trans-

fers at retail by inventory locations to each of the other inventory locations are accumulated monthly and cost evaluations are made by the application of the general parts cost percentage to permit inventory transfer postings at cost to the respective general ledger accounts. Again, control of inventory transfers is assured by accounting for invoice numbers in each series.

Retail Method Not Used to Control and Adjust Inventories

While most retail inventory systems also utilize the accumulated total "at retail" for subsequent purposes of inventory control and inventory evaluation by application of the classification percentages under conventional applications, the method discussed herein does not. With the exception of a memorandum account at retail of the main factory replacement parts inventory, maintained for (1) statistical purposes and (2) evaluating the effect on the established percentage of general cost and price changes, no summary of the retail totals of amounts on hand is maintained for the various inventory locations and so no record exists to which to apply a percentage (or percentages, if more than one were established) to determine approximate inventory at cost or against which to take a physical inventory priced at retail for control or inventory adjustment purposes. For inventory control purposes, we maintain at each inventory location a simple stock record system which indicates quantities on order, quantities on hand, receipts and disbursements, the posting reference, and dates of such transactions. No cost or price data is recorded on these records.

As to evaluation between physical inventories, our general ledger controlling accounts for these various inventory locations reflect only the estimated standard cost of the items on hand. When a physical inventory of replacement parts is taken at Caterpillar, it is priced at standard costs and the depot and factory book inventories are adjusted on this basis. On such occasions, the quantity of each part is reported on an individual punched accounting card which, in turn, is costed at standard cost, and priced at retail (cost to dealer). Next all cards are extended and accumulated simultaneously by the 'digiting' process. The percentage of standard cost to selling price is computed from current totals of these two amounts for each inventory location being inventoried.

In summarizing physical inventories, cost and price data is developed which could be used in the direction of more detailed

application of the retail method, other than adjusting our controlling accounts to standard cost as mentioned in the preceding paragraph. However, these percentages for individual inventories are also determined for purposes of analysis and review of the over-all company percentage in actual use. As previously mentioned, the parts depots do not carry a complete line of parts, nor is the volume and mix of the inventory of any one parts depot necessarily representative of (1) the over-all line of replacement parts, or (2) the mix of sales of the individual parts depot. Similarly, when the percentage is determined from the replacement parts inventory of the main factory, it is used only for analysis and review purposes because of the presence of slow-moving items of a noncurrent nature.

Evaluation of the Method

It is true that the system may emphasize accuracy in cost of sales. As stated, our general cost percentage as determined and revised from time to time reflects primarily the ratio existing between standard cost and retail price of *current* production of fabricated parts and purchased finished parts because (1) the major portion of transactions between physical inventory dates terminates in cost of sales and (2) in our opinion, the actual cost percentage for any one individual physical inventory does not reflect the actual pattern of costs of sales because of the presence of slow-moving noncurrent parts.

The success of this system is based on the development and maintenance of a general cost percentage which accurately reflects the spread between standard cost and retail prices for the replacement parts inventory for the company as a whole, month after month, in the face of general group and individual cost and price changes as well as engineering changes. Also, the use of this percentage is governed through continuous review in order to maintain the objective of accurate book figures for cost of sales and hence inventories, and, less directly, good inventory control. As has been emphasized, the book figures resulting from this retail costing method are adjusted, upon the taking of physical inventories, to standard cost of items on hand. We have experienced no material difficulties in maintaining a serviceable cost percentage or in achieving the above objectives.

USE OF THE RETAIL INVENTORY METHOD TO COST SALES AND VALUE FINISHED GOODS OF A PHARMACEUTICAL MANUFACTURER

by RAYMOND J. TERKHORN,
Chief of Budgets and Standard Cost Section,
Eli Lilly Co., Indianapolis, Ind.

The implications of this article might well include the thought that, when product or product group costing is well-controlled in a manufacturing company, there may be no reason why, if desired, the retail inventory method of controlling and valuing inventories and determining cost of sales may not be introduced with good results. It is recognized also that the company's finished goods must be susceptible of the same sort of classification into items of like kind and profit margin as in the case of retail inventories.

RECENTLY articles have started to appear suggesting, to one degree or another, that the so-called retail method of inventory accounting is not wholly restricted to the retail field. This article describes application of the retail method of inventory evaluation in one of the larger pharmaceutical manufacturing houses, where its use has proven satisfactory for a good many years from the standpoint of two major objectives:

1. To act as an effective tool in inventory evaluation.
2. To furnish a means of costing shipments, making possible the production of a monthly operation statement in a situation in which this might otherwise be impracticable except on an estimated basis.

It will be readily apparent that if the retail inventory method is to be used by a manufacturing company, product or product group costs stand in the relative position of purchase cost. For that reason a well-controlled cost system must be in existence. The material which immediately follows is given before the particulars of the retail inventory method application in our company so that it may be seen, at least broadly, how the costs which we rely on are compiled and controlled.

In the first place, there is close budget control. This is departmental and apart from assignment of costs to products, yet it is

EXPENSE ANALYSIS AND BUDGET COMPARISON

MONTH ENDING January 1, 1949 — ACCOUNT xy Tablet Manufacturing

ANNUAL BUDGET		EXPENSE CURRENT MONTH	EXPENSE YEAR TO DATE	BUDGET YEAR TO DATE	EXPENSE LAST YEAR TO DATE	OVER OR UNDER BUDGET
	CONTROLLABLE EXPENSE					
$60,800.00	10000 WAGES	5,100.00	5,100.00	5,066.66	4,937.00	-33.34
	10500 INSPECTION WAGES					
1,500.00	11000 SALARIES	125.00	125.00	125.00	120.00	
4,650.00	11500 EMPLOYEE BENEFITS*	387.55	387.55	385.00	362.00	- 2.55
15,000.00	12000 REPAIRS AND MAINTENANCE	968.43	968.43	1,250.00	1,003.39	+ 281.57
8,000.00	13000 MISC. SUPPLIES AND EXPENSE	600.00	600.00	666.66	748.92	+ 66.66
	14000 MATERIALS					
89,950.00	TOTAL CONTROLLABLE EXPENSE	7,180.98	7,180.98	7,493.32	7,221.31	312.34
4,860.00	15000 TAXES, INSURANCE, AND DEPRECIATION	405.00	405.00	405.00	399.00	
32,500.00	16000 OVERHEAD DISTRIBUTION**	6,875.00	6,875.00	6,890.00	6,840.00	+15.00
177,310.00	TOTAL	14,460.98	14,460.98	14,788.32	14,460.31	327.34

STATISTICAL DATA

	UNIT	CURRENT MONTH	YEAR TO DATE	LAST YEAR TO DATE
M. & S. STANDARD UNITS	Mins.	65,797	65,797	66,599
COST DEPT. STANDARD UNITS	Mins.	60,420	60,420	61,780
COST PER UNIT (COST DEPT.)		.239	.239	.234

*Includes Social Security Taxes, Cost of Retirement Benefits, and Group Insurance
**Includes Rental & Service, Utilities, Personnel, Material Handling, Production and Biological Control Expense

EXHIBIT 1

L-920
ITEM

LOT COST RECORD

LOT NUMBER

L-920

LOT COST RECORD

ITEM: Tablet No. 197 Asafetida, 5 grs., C.C. — LOT NUMBER: 448556

DATE CLOSED: 9-17-48 — THEORETICAL YIELD: 128,000 — ACTUAL YIELD: 126,500

SIZE PKG.	NO. OF PKGS.	SELLING PRICE	SALES VALUE	FILL PER PKG.	TOTAL LABOR	FINISH PER PKG.	TOTAL LABOR	Bottle No.	PKG. COST	TOTAL PKG. MATERIAL	BULK UNIT COST	FINISHED COST
100	465	42	195 30	026	12 09	025	11 63	39	029	13 49	19	27
1,000	20	3 30	66 00	048	96	062	1 24	50	07	1 40	1 90	2 08
5,000	12	13 75	165 00	10	1 20	104	1 25	141	126	1 51	9 50	9 83
TOTAL SALES VALUE			426 30	DEPT.	222	DEPT.	222				BULK COST	1 90
TOTAL LABOR					14 25		14 12	TOTAL CR. STORES 04		16 40		

MATERIAL NO.	MATERIAL SOURCE	MATERIAL AMOUNT	LABOR & BURDEN NO.	LABOR & BURDEN SOURCE	LABOR & BURDEN AMOUNT
9	01	191 15	9	309	2 80
		25 16		341	1 70
				342	8 70
				330	10 84
TOTAL MATERIAL		216 31	TOTAL LABOR		24 04
UNIT PER M		1 71			19
TOTAL CR. STORES 10		240 35	DEBIT STORES 70		285 12

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Exhibit 2

a necessity in connection with sound costing. Exhibit 1 is offered for the purpose of displaying the control used for each manufacturing department as to items of expense and for development of cost rates.

The controls for each department are set up on a ledger card system, adaptable to a posting machine, using one card for each account, including the sundry account. The entire file of cards for all departments represents the factory ledger and should be in balance with the factory ledger control (in process costs) as shown in the general ledger when all postings are completed for the month.

Controlled Job Costs

Of more direct pertinence to product or product group costs is the existence of a job cost system and, as each job falls within a product group, the basis of costs by product classification is thereby provided. All manufacturing jobs that go through the plant are assigned permanent identification lot numbers. We find the cost for each lot along the lines of Exhibit 2. A recital of the operating routine related to this job order

system will show with what degree of precision underlying procedures are carried out. A requisition to manufacture a lot, specifying a particular item, is sent by the planning department to the ticket issue clerk. A blueprint working formula is issued for the item which shows a definite quantity to be manufactured and gives complete instructions for each step in the manufacturing operations. At the time this working formula is issued, requisitions for the quantities of material needed are sent to the stores. (When the material is supplied, the requisitions are forwarded to the material stores records where deductions are made from the perpetual inventory control record for each item). Time cards are issued for the steps in the operations and sent along with the working ticket to the manufacturing departments.

As the manufacturing processes are completed, the time cards are forwarded to the methods and standards department for computation from the number of units reported the minutes that are allowed for the operation on each time card tab. These tabs are used for determining the individual bonus and then are forwarded to the cost department. The cost department extends all requisitions daily, as well as time cards, and posts them to the individual jobs.

After the manufacturing operations are complete, approval is given by the inspection department and the goods are delivered to the filling and finishing department. Further working orders are issued with complete instructions as to the method to be used for filling, the size packages to be filled, and the finishing instructions. A space for the registration of the quantity and size package filled is shown at the bottom of the working ticket and, as an order is completed, the information is recorded on it. Upon completion of the finishing operations, the working tickets are returned to the ticket issue clerk and are officially closed by rubber stamp notation and dating. The audit clerk, using the working ticket as a guide, then scans the job cost sheets to be sure that all material used has been accounted for and that all time cards for each of the operations have been posted.

The next step in the operations is to cost the filling and finishing operations and apply packaging materials cost. Filling and finishing and the packaging material standards are posted at money value from standard schedules. These values constitute the credit to the related departments and include direct labor and overhead. The selling price as shown by the price list is then entered on the

job (or lot) card. A check of Exhibit 2 will reveal record of the cost data which has just been described. There is also a summary card for each product to which unit cost results are posted. This summary card is used for the determination of fluctuations in costs of the same item and to detect errors. After a thorough check, the job cost sheets are recapped and a journal voucher prepared charging all cost to the finished stock control account—these would be "purchase" costs, thinking in terms of the retail method.

Mechanics of Applying Retail Method to Manufactured Goods

As has been indicated, the retail inventory method is essentially a method which makes use of sales prices and markup percentages in costing sales and for inventory control. Reasonably accurate markup percentages form the key element in the reliability of such a method and are in turn dependent on establishment of sales classifications, homogeneous as to type of product and range of profit, for each of which a separate percentage can be established. The costing of shipments and valuation of inventories by this method has been recognized in retail merchandising operations. In the case of a manufacturing company, corresponding application requires developing the gross margin of profit on each class as the items are manufactured, and in effect taking this gross margin into income on an average basis proportionate with sales affected. In addition, selling prices must be fairly stable for the procedure to work well.

In our particular application of the retail method, the finished product inventory control was broken down by a subsidiary analysis distinguishing the product classification deemed appropriate by the management for the purpose. As the charges to the finished stock control from the work in process account are journalized, they are broken down into these classifications and code numbers assigned to each group, as follows:

1. Ampoules	16. Ointments
11. Biologicals	17. Pills and tablets
13. Elixirs and syrups	18. Filled capsules
14. Fluid extracts and tinctures	19. Empty capsules
15. Liniments, solutions, and syrups	22. Other

The table below, which uses the ampoules classification as an example and contains hypothetical figures, resembles the markup and cost percentage summaries familiar to department store ac-

countants. It will be noted that an initial inventory at sales value and cost, and the accumulation of cost and sales value figures on all completed production for jobs in the product class for the month, will give all the data to establish a cost percentage.

1 AMPOULES

	Net sales value	*Cost*	
Inventory value 1/1/48.....	$100,000	$80,000	
Production during January '48..	50,000	40,000	
Corrugated box use.....		1,000	
Narcotic stamp use.....		200	
Sales price increases ("additional markups")	5,000		
Totals for cost percentage..	$155,000	$121,200	78.19%

The same record is kept for each of the product classifications and the cost percentage comparable to the 78.19 per cent shown above is determined. To obtain the closing inventory book at cost, under the method, it is only necessary in each case to deduct sales and sales price decreases (markdowns) from the sales value columns, thus obtaining the closing inventory at retail, and then to apply the cost percentages. Finished stock physical inventories need only be priced at the regular selling price.

The necessity for not only grouping sales by classes but also "breaking out" sales price adjustment up or down gives especial importance to analysis and coding of sales as they occur. Price exceptions should be segregated in the sales analysis to cover sales that are made at other than regular selling price, due to preference discounts. For instance, if the regular selling price carries a discount of 15 per cent and on a specific sale an additional 1½ per cent discount is allowed, it will be necessary in the sales analysis to keep separately by discount percentages the value of the sales which vary from the regular selling price which has been used in transferring the production to the inventory summary at retail.

The above procedure was installed eleven years ago in an attempt to reduce the clerical effort required to cost all shipments at actual cost and to eliminate the clerical errors which always dogged such a detailed operation. The method has been very successful in this regard for, as each item is billed, the catalog sales price can

easily be copied to the invoice without reference to another index to determine costs. Since billing procedures have been mechanized through the application of punched card techniques, the sales price used for billing is carried in prepunched cards in tub files for each item and package size. Orders are run across this tub file, cards are pulled, punched for quantity extended, verified, and used for invoicing. By merely sorting by commodity groups all the detail cards used for billing purposes for the current period and year to date, the entire months sales may be costed by the application of respective cost percentages to the class sales totals.

Weaknesses of the Method

The principal danger in the use of the retail system for sales costing and inventory evaluation lies in the possibility that poor judgment will be employed in setting up commodity groups. For the method to result in a true reflection of operating conditions, all items within a group must be comparable in cost and sales value. In addition, the rate at which different items are supplied in inventory, by commodity groups, must be comparable to the rate of withdrawal. In other words, if the higher cost items within the group are stock-piled during a period in which sales are normal for all items making up the group, the result of the application of the cost percentage developed from this production will be overcosting of sales during and following the stock-piling period. On the other hand, the reverse is true if low cost items are stock-piled.

A second weakness of the system lies in its inability to reflect promptly in financial statements, by way of the cost of sales account, any sudden increase or decrease in manufacturing costs. In our procedure cost percentages are developed cumulatively from one annual inventory to another. If, for example, a sudden change in manufacturing costs occurs in July, the effect of such change is minimized considerably because what has gone before in the calendar year serves to weight the results thereafter. Other methods of control are required to point out variations in manufacturing costs and to disclose the full amount and effect of such changes. We feel that the control desired is adequately provided for in such reports as variances from standard costs, manufacturing loss reports, expense analysis reports, reports of nonproductive time, and through the close coordinated operating position of the cost department with manufacturing departments.